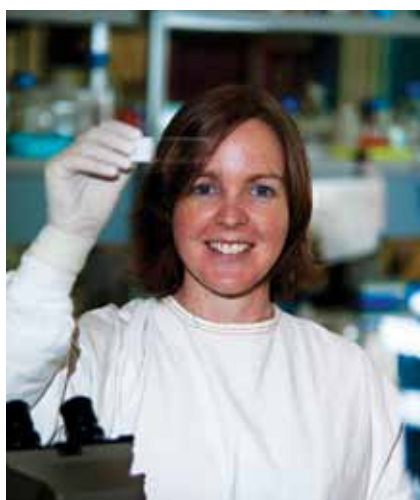


# DR HEIDI HILTON

– unlocking cell secrets to head off breast cancer

University of Sydney at Westmead Institute for Cancer Research,  
Westmead Millennium Institute



What is it about the female hormone progesterone that links it to breast cancer? It's a complex, challenging, often frustrating issue for scientists seeking ways to prevent and treat the most commonly diagnosed cancer among Australian women.

It's certainly of profound concern to 31-year-old Dr Heidi Hilton, Postdoctoral Research Associate at the Westmead Institute for Cancer Research in Sydney. Heidi's Cure Cancer Australia Foundation-funded research aims to investigate cell imbalances in breast tissue, how these are related to the action of progesterone, and how this knowledge may lead to strategies to head off the development of breast cancer.

"I'm very keen to contribute to the significant advances that are made in this field here in Australia," says Heidi.

What exactly does this work involve? First, some science. Progesterone is critical for normal breast development, as well as being a key component in hormone replacement therapy (HRT) and the oral contraceptive pill. Scientists know it's also a major driver of breast cancer risk.

## CELL COMPOSITION

It has long been known that the composition of cells in normal breasts differs dramatically

from those in breast cancer tissue, says Heidi. And it's well known that the development of many breast cancers can be traced to stem and progenitor cells that become differentiated into different types of cell when breasts are developing: luminal and myoepithelial cells. More than 90% of breast tumours consist of only the luminal type.

Heidi Hilton's lab has previously shown that the action of progesterone can regulate the fate of cells as they're developing in human breasts. Her project now, using human breast tissue, aims to investigate exactly how changes in progesterone signalling – like that which occurs during HRT – may alter the development of normal cells, and thus result in an increased susceptibility to breast tumours.

"Understanding what causes the early imbalance in the different cell types in the breast, particularly if progesterone is involved in the process, may point to preventative strategies," says Heidi. "If we can interrupt progesterone action to reverse the process, we'll be making great progress. That lies at the heart of our work."

## A PASSION FOR RESEARCH

Heidi Hilton was born in Sydney. Having been interested in science since she was in primary school, she thoroughly enjoyed some work experience she completed in a cancer genetics lab at the Kolling Institute of Medical Research at the age of 16.

"I was fascinated to be working in an actual laboratory and finding out what it's like to conduct real experiments where you don't know what the answer will be," she says.

After finishing high school at North Sydney Girls High, she went on to complete a specialised science degree (in molecular biology and genetics) at the University of Sydney, in 2001.

"My initial experience in medical research as an undergraduate, and particularly my year of lab research during my Honours, reinforced my interest in the field," says Heidi. "It motivated me to look for a job in medical research where I could apply the scientific knowledge I'd learned at university and make a meaningful contribution to advances in medicine."

Having had close personal experience with the impact of breast cancer herself, Heidi chose to focus her efforts in the field to try to understand more about how breast cancer is caused.

Then in 2002, she applied for and won a position as research assistant at Sydney's Garvan Institute of Medical Research where she gained more practical experience in breast cancer research. Finding the field fascinating and keen to continue working in it, she completed a PhD at the Garvan and now works under the guidance of Professor Christine Clarke in the Breast Group at the Westmead Institute for Cancer Research.

"I'm enjoying pursuing more translational cancer research using human breast tissue specimens," explains Heidi. "My dream is to try to contribute to improvements in the diagnosis, treatment and prevention of breast cancer in Australia and worldwide."

## UNPARALLELED OPPORTUNITY

Receiving the Cure Cancer grant has offered her "an unparalleled opportunity" to do that, she says. In the current medical research climate in Australia, gaining access to the limited funding that's available is a highly competitive process. It's even tougher when you're a young postdoctoral researcher seeking to start an independent research career.

The grant will allow Heidi to gain invaluable experience in independent research and, she anticipates, some high-impact publications of clinical significance that will provide a critical stepping stone for her career.

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